

BS ISO 18437-5:2011



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Mechanical vibration and shock — Characterization of the dynamic mechanical properties of visco-elastic materials

Part 5: Poisson ratio based on comparison
between measurements and finite element
analysis

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National foreword

This British Standard is the UK implementation of ISO 18437-5:2011.

The UK participation in its preparation was entrusted to Technical Committee GME/21, Mechanical vibration, shock and condition monitoring.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Part 5: Poisson ratio based on comparison between measurements and finite element analysis

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mécaniques dynamiques des matériaux visco-élastiques —*

*Partie 5: Nombre de Poisson obtenu par comparaison entre les
mesures et l'analyse par éléments finis*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 18437-5 was prepared by Technical Committee ISO/TC 108, *Mechanical vibration, shock and condition monitoring*.

ISO 18437 consists of the following parts, under the general title *Mechanical vibration and shock — Characterization of the dynamic mechanical properties of visco-elastic materials*:

- *Part 2: Resonance method*
- *Part 3: Cantilever shear beam method*
- *Part 4: Dynamic stiffness method*
- *Part 5: Poisson ratio based on comparison between measurements and finite element analysis*

The following part is under preparation:

- *Part 1: Principles and guidelines*

Introduction

Visco-elastic materials are used extensively to reduce vibrations in structural systems through dissipation of energy (damping) or isolation of components and noise levels in acoustical applications through modification of reflection, transmission, or absorption of acoustic energy. It is often required to have specific dynamic mechanical properties in order for such materials to function in an optimum manner. Energy dissipation is due to interactions on the molecular scale and can be measured in terms of the lag between stress and strain in the material. The dynamic mechanical properties, such as Young modulus, loss factor and Poisson ratio, of most visco-elastic materials depend on frequency, temperature, pre-strain and strain amplitude. The choice of a specific material for a given application determines the system performance. The goal of this part of ISO 18437 is to provide brief descriptions of several methods, the details in construction of each apparatus, measurement range, and the limitations of each apparatus. This part of ISO 18437 applies to the linear behaviour observed at small strain amplitudes.

